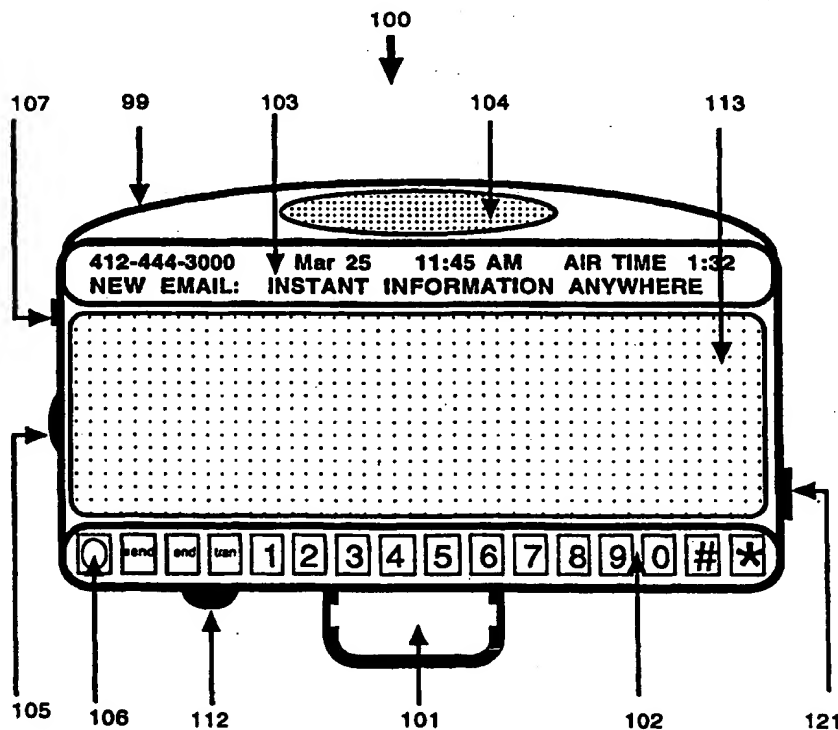


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TITLE

MOBILE TELEPHONE DOCKING STATION

BACKGROUND OF INVENTION1. Field of the Invention

This invention relates in general to a mobile telephone docking device and in particular to the mounting of such device on the windshield to facilitate the safe use of such device.

2. Brief Description of the Prior Art

With the recent explosion of mobile telephone communication devices and the use of such in motor vehicles, a serious safety issue has been raised. The use of mobile telephones in moving vehicles has created a national highway safety issue with several states moving to possibly ban the use of a hand held mobile telephone while operating a moving motor vehicle. The sharp increase in traffic accidents relating to the use of mobile telephones has alarmed the insurance industry and started a national debate of this safety issue.

The mobile telephone industry in a rush to capitalize on the popularity such phones has focused on smaller being better. Small hand held mobile telephones force the user to focus carefully to maneuver the small keypads to initiate a successful call and in many situations requiring the user to use reading glasses while driving.

The size of display screens further increases the risk of a highway accident. Small, difficult to read, crowded digital displays force drivers to take their eyes and mind off the road.

Typically, a mobile phone has been mounted in a vehicle on or under the dashboard or on a console between the driver's seat and the front passenger's seat.

Even when a mobile telephone is mounted in a motor vehicle, the location normally requires the driver to look down and maneuver the same small mobile telephone controls which are now further away and more difficult to read. During the dialing process, drivers are forced to look down while continuing to drive with their left hand. This scenario has often resulted in serious accidents—it only takes a split second to cross a center line. Also, the night time use of mobile telephones dramatically increases the risk of such highway accidents.

Manufacturers have attempted to solve these problems in a number of ways. One system integrates a mobile telephone into the driver's side sun visor, such that a call is placed or received when the visor is in a flipped down position. However, this system tends to divert the driver's attention away from the traffic around him. Another proposal involves the creation of voice activated mobile telephones. These telephones do not enable the driver to see important status information such as signal strength, the duration of the call and the telephone number that has been called.

In United States Patent No. 5,566,224 of ul Azam et al. disclose an RF communication device which is used in combination with a mobile telephone. This device enables the display of status information on a mirrored surface such as a vehicle's rear view mirror. A user of this system must divert his attention away from traffic conditions to use the keypad or retrieve the handset from a holder.

The use of mobile telephones is increasingly affordable to larger segments of our society. Originally used mainly for business these phones are now often used by

the youngest and oldest of the nation's drivers. Thus, there is a need for a mobile telephone docking station which will enable the driver to use the telephone without diverting his eyes from the road.

DESCRIPTION OF INVENTION

The present invention provides a greater level of highway safety. It is comprised of a single component mobile telephone docking station with a horizontal control center preferably attached directly to the windshield of a motor vehicle. The control center is preferably designed with a means for a horizontal keypad and display screen that are unique in mobile telephone designs. The present invention is preferably designed with means to support a rearview mirror without infringing on the primary use of the mirror itself. The present invention never requires a user to look away from the highway, as the large horizontal key pad is positioned in front of the driver for heads-up operation.

The present invention never requires a driver to look away from the highway to view the display screen as the large horizontal display screen is positioned in front of the driver and uses large, easy to read characters. When a user docks a compatible mobile telephone in the docking station it may be operated by the safety phone control center. The present invention's speaker may be mounted above the display screen or in a remote location inside the vehicle. The present invention's antenna is preferably mounted directly above the safety phone on the outside of the windshield. The present invention preferably uses the highest level of commercially available mobile phone technology.

The present invention has been designed to achieve a greater level of safety when using a mobile telephone while operating a motor vehicle. My device never requires the driver to look down or away from the highway to place or receive a phone call. It does not require the driver to use the hand held telephone controls when docked in the safety phone docking station.

I provide a mobile telephone docking station and control center preferably attached directly to the windshield. The control center preferably has a horizontal keypad and display screen—such keypad and display screen being of greater size to permit easy use and viewing. The safety phone will preferably included an antenna incorporated with and directly above the unit attached to the outside of the windshield and a separate speaker box preferably attached to the unit. The present invention may comprise a means to support a conventional rear view mirror assembly with a keypad and display screen both separate and apart from the rearview mirror. Upon the docking of a compatible mobile telephone, such phone will be operated by the safety phone control center which may perform functions common to commercially available docking stations.

The docking station preferably is mounted to the windshield of a vehicle. The user slides a compatible hand-held mobile phone into the docking station. The user may then use the controls along with the display screen to make or receive telephone calls. Calls may be placed by hand or voice commands depending on the users hand held phone. The user may then use the hands-free features of the phone to converse or may at any time un-dock the phone to talk in private. The present invention provides a heads-up operating platform, never requiring the user to look down or away from the

highway to place or receive phone calls. When the user's phone is docked, the safety phone will charge, increase the power output, improve the reception and perform other functions common to a commercial docking station.

Other objects and advantages of the invention will become apparent from a description of certain preferred embodiments shown in the figures.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 illustrates a front view of a present preferred embodiment of my mobile telephone docking station and control center device which is designed to support a rearview mirror assembly attached to the windshield.

Figure 2 is a side view showing the embodiment of Figure 1.

Figures 3 and 4 are front and side views respectively of a second preferred embodiment of the present invention attached to the windshield which embodiment does not support a rearview mirror assembly.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring to Figures 1 and 2 I provide a mobile telephone docking station and control center 100 directly attached to the windshield of a motor vehicle and capable of supporting the rearview mirror assembly.

The device 100 is comprised of a housing 99 which supports a docking unit 101. To provide a compact device the docking unit extends behind the front surface 97 of the housing 99. The docking station performs all the operations common to conventional docking devices; for example, properly charging the battery and increasing the power of the mobile phone. Docking unit 101 preferably secures any compatible mobile telephone.

Currently, mobile telephones vary in size. Thus, one docking unit will not accommodate all types of cellular telephones. When produced commercially a variety of docking units 101 could be offered to accommodate a variety of existing cellular telephones. Alternatively, a standard docking unit could be made to have modules or adapters that could be added to accommodate other telephones which will not fit in the standard unit. Preferably, the electronics are such that the telephone can be removed from the docking unit while a call is in progress to allow for more private conversations. Drivers will be inclined to use the device 100 for the majority of their calls so as not to reduce their mobile phone battery life.

A keypad 102 and a display screen 103, both coupled to docking station 101, make up the control center portion of the device 100. Keypad 102 preferably extends the length of the lower portion of the front surface 97 of the device 100. In a present preferred embodiment this length is 9 inches (23 cm.) This unique horizontal keypad location is crucial to safe use, allowing the driver to place a call by hand while maintaining full rearview mirror functionality and highway visibility. Keypad 102 preferably employs the largest individual buttons that the length of housing 99 will permit to improve ease of use. These buttons may be consistent in design with those currently common to the cellular telephone industry and the number of such function buttons may be variable. If desired, some of the keys may be located to the left and to the right of the display screen 113. If this is done all of the numeric keys should be below the display screen for safer operation. When a user docks a compatible mobile telephone in the docking station 101, the user may operate the docked mobile phone

with keypad 102. Preferably, the keyboard will be activated when a telephone is placed in the docking unit.

Display screen 103 is preferably located along the top portion of the housing 99 in a horizontal configuration. Information on display screen 103 may be displayed using larger characters for quick information recognition. The device area is preferably 4.5 square inches (29 sq. cm.), 300% bigger than the 1.5 sq. inch (10 sq. cm.) display on most cell phones. Display screen 103 preferably displays data consistent with mobile telephone use; for example-signal strength, current numbers, caller ID, talk time, etc. Pager or e-mail messages may also be displayed. I prefer to construct the display so that the display is activated when a telephone is placed in the docking unit.

I also prefer to provide a speaker box 104 and microphone 106 on the housing 99, and coupled to the docking station 101. The speaker box 104 preferably is attached near the top of the housing, to be an acoustically designed unit to broadcast ample sound within the vehicle. Speaker 104 volume may be controlled by dial 105 on driver's side of unit. Microphone 106 may be located on the driver's side of the housing 99 and may be slightly recessed to decrease speaker interference. A remote microphone jack 107 may be provided for an optional plug in microphone 108 shown in Figure 2. Alternatively, a user can provide an optional remote microphone and/or speaker enclosure (not shown) located near the driver and wired directly to device 100. The docking station may also have a data port 121 into which the user may connect a laptop computer, or remote display board, or other device to transfer data using the mobile telephone. An antenna 109 is preferably mounted directly above the housing 99 on the windshield 98 of the vehicle to facilitate easy installation.

The housing 99 is preferably connected to the windshield by a means for an adjustable support bracket 110. The bracket 110 may also act as a conduit for the required wiring to the unit. Required wiring may also be concealed by conduit 111 connected to adjustable support bracket 110 to route wires to the vehicle. The length of wire conduit 111 shall be determined by installation demands. The power to the unit 100 is preferably controlled by the ignition switch on the vehicle.

As illustrated, in Figures 1 and 2, there is provided a means of support, for a rearview mirror assembly 113 which will not encroach or diminish the intended use of such mirror. The rearview mirror assembly 113, may be adjustable by day/night lever 112. Mirror 113 is preferably consistent with vehicle manufacturer's safety mirror assembly needs. Consequently, the surface area of the mirror 113 will be the same as the surface area of a conventional rear view mirror.

A portion of housing 99 indicated by dotted box 96, is preferably reserved for needs of the vehicle manufacture for accessories, such as reading lamps, thermometer, compass, or global satellite positioning device. The housing 99 should employ a means to dissipate heat gain such as reflective coatings and air vents. The housing 99 should contain state-of-the-art communication circuitry for mobile telephones, preferably a cellular telephone. Such technology may consist of voice activated or hands free capabilities. The housing may also contain electronics within the region designated by box 120 to provide limited range transmission capabilities between the docking station and a remote device such as a portable telephone, a laptop computer, a speaker or a microphone. One such system that shows much promise for this application is known as Blue Tooth.

For a private call the user may remove their mobile phone from docking station 101 at any time during a call, preferably without disconnecting the call. This eliminates the need for a hand set wired directly to the housing 99. The device 100 will preferably operate any compatible mobile telephone.

A second present preferred embodiment 200 shown in Figures 3 and 4 can be attached directly to the windshield of a vehicle but does not contain a rearview mirror. The device 200 is comprised of a housing 99 with attached docking unit 101, that performs all the operations common to such docking devices; e. g. properly charging the battery and increasing the power of the mobile phone. Like the first embodiment, docking station 200 preferably secures any compatible mobile telephone.

This housing 99 has a keypad 102 and a display screen 103, both coupled to docking unit 101, which make up the control center of the device 200. Keypad 102 preferably extends the length of the lower portion of the housing 99. This unique horizontal keypad location is crucial to safe use, allowing the driver to place a call by hand while maintaining full rearview mirror functionality and highway visibility. Keypad 102 preferably employs the largest individual buttons that the phone length will permit to improve ease of use. Those buttons may be similar in design to those used in the cellular telephone industry and the number of such function buttons may be variable. Some of the buttons, preferably only function buttons, may be located to the left and to the right of the display screen 103. When a user docks a compatible mobile telephone in the docking station 101, the user may operate the docked mobile phone with keypad 102.

Display screen 103 is preferably located along the top portion of the housing 99 in a horizontal configuration. Information on display screen 103 may be displayed using larger characters for quick information recognition. Display screen 103 preferably displays data consistent with mobile telephone use; for example-signal strength, current numbers, caller ID, talk time, e-mail messages, etc.

As in the first embodiment, speaker box 104 and microphone 106 are provided. The speaker box 104 is preferably attached at the top of the housing is an acoustically designed unit to broadcast ample sound within the vehicle. Speaker 104 volume may be controlled by dial 105 on the driver's side of unit. Microphone 106 may be located on the driver's side of safety phone 200 and may be slightly recessed to decrease speaker interference. Also preferably located on the driver's side of the housing is a remote microphone jack 107 for optional plug-in microphone 108. An optional remote microphone and/or speaker enclosure located near the driver could be wired directly to the safety unit 200. As in the first embodiment, portions of the housing 96 and 120 may contain vehicle accessories and limited range transmission electronics.

An antenna 109 is preferably mounted directly above the unit on the windshield 98 of the vehicle to facilitate easy installation. The housing 99 contains all required communications circuitry and is held by an adjustable support bracket 110. The bracket 110 may also act as a conduit for the required wiring to the unit. Conduit 111 connected to adjustable support bracket 110 is provided to route wires to the vehicle. This embodiment may also have space in the housing 99 for accessories, such as reading lamps.

For a private call the user may remove his mobile phone from docking station 101 at any time during a call, preferably without disconnecting the call. This eliminates the need for a hand set wired directly to the housing 99.

While I have shown and described certain present preferred embodiments of my mobile telephone docking station it should be understood that modification can be made to accommodate any mobile radio frequency communication device or vehicle manufacture design needs without departing from the true spirit of invention.

I claim:

1. A mobile telephone docking station comprising:
 - a. a housing sized to accommodate communications and power circuitry for a mobile telephone, the housing having a front surface;
 - b. a mobile telephone docking unit attached to the housing the docking unit sized to receive a mobile telephone;
 - c. a keypad attached to the front surface of the housing;
 - d. a display for displaying status information of the mobile telephone, the display attached to the front surface of the housing; and
 - e. a mounting bracket attached to the housing and configured for attachment to a vehicle windshield.
2. The mobile telephone docking station of claim 1 also comprising a mirror attached to the front surface of the housing.
3. The mobile telephone docking station of claim 2 wherein the keypad is located below the mirror and the display is located above the mirror.
4. The mobile telephone docking station of claim 1 also comprising a speaker attached to the housing.
5. The mobile telephone docking station of claim 1 also comprising a remote speaker connected to the housing.

6. The mobile telephone docking station of claim 5 wherein the remote speaker is connected by concealed wiring.

7. The mobile telephone docking station of claim 1 also comprising an antenna coupled to circuitry contained within the housing.

8. The mobile telephone docking station of claim 1 also comprising a microphone connected to the housing.

9. The mobile telephone docking station of claim 8 also comprising a microphone jack through which the microphone is connected to the housing.

10. The mobile telephone docking station of claim 11 also comprising a data transfer port connected to the housing to enable a device to be connected to the housing and transfer data between a mobile phone in the docking station and the device.

11. The mobile telephone docking station of claim 1 wherein the keypad contains at least some keys which are positioned along a horizontal line.

12. The mobile telephone docking station of claim 11 wherein the at least some keys are numeric keys.

13. The mobile telephone docking station of claim 1 wherein the display is activated when a mobile telephone is placed within the docking unit.

14. The mobile telephone docking station of claim 1 wherein the keypad is activated when a mobile telephone is placed within the docking unit.

15. The mobile telephone docking station of claim 1 wherein the housing is sized to receive at least one of a compass, a reading light, a thermometer and a global satellite positioning device.

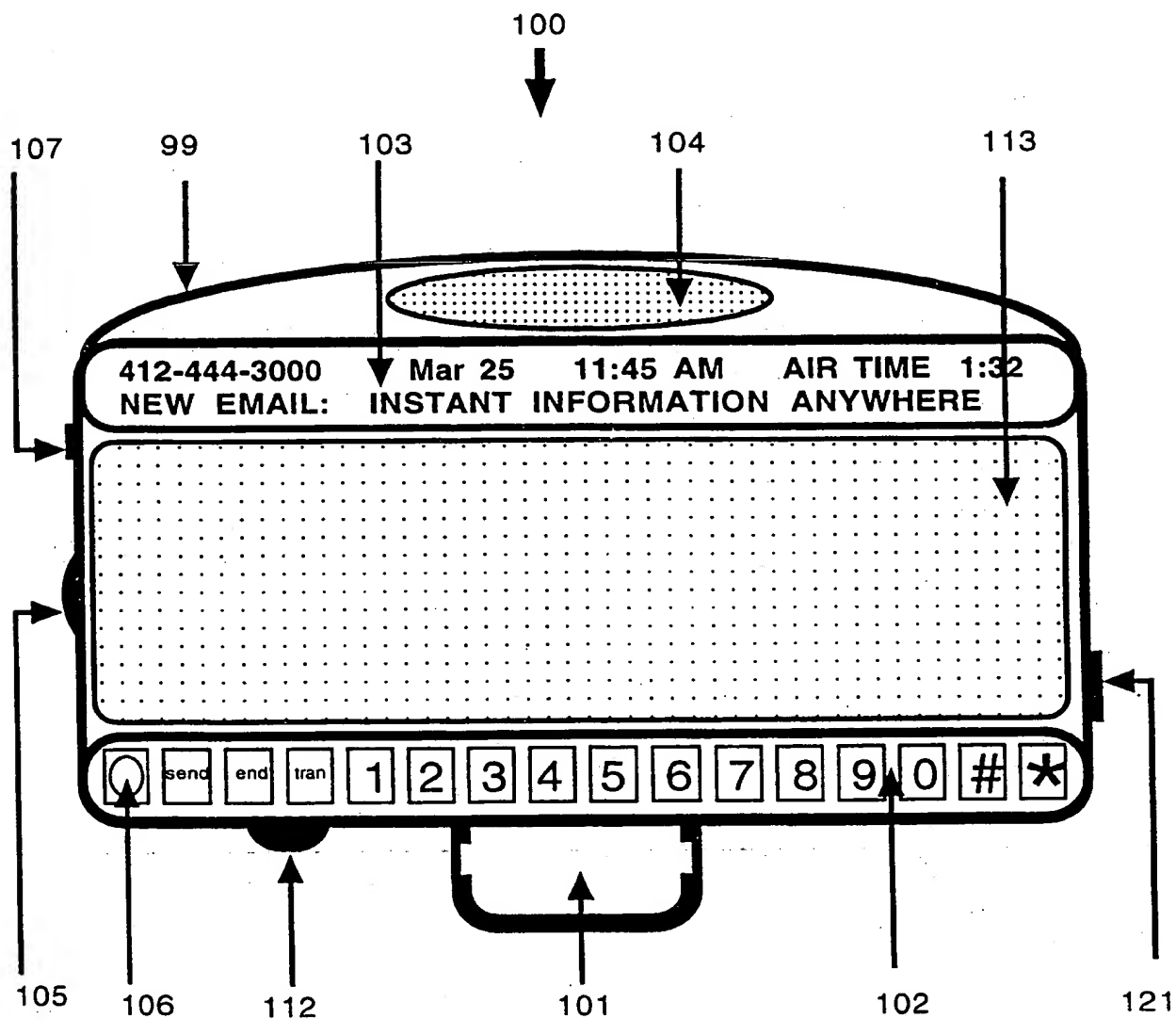
16. The mobile telephone docking station of claim 1 wherein the docking unit extends behind the front surface of the housing.

17. The mobile telephone docking station of claim 1 wherein the housing contains electronics to provide limited range transmission capabilities between the docking station and a device remote from the docking station and within the limited range.

18. The mobile telephone docking station of claim 17 wherein the device is selected from the group consisting of a portable telephone, a laptop computer, a speaker, a microphone and a remote display board.

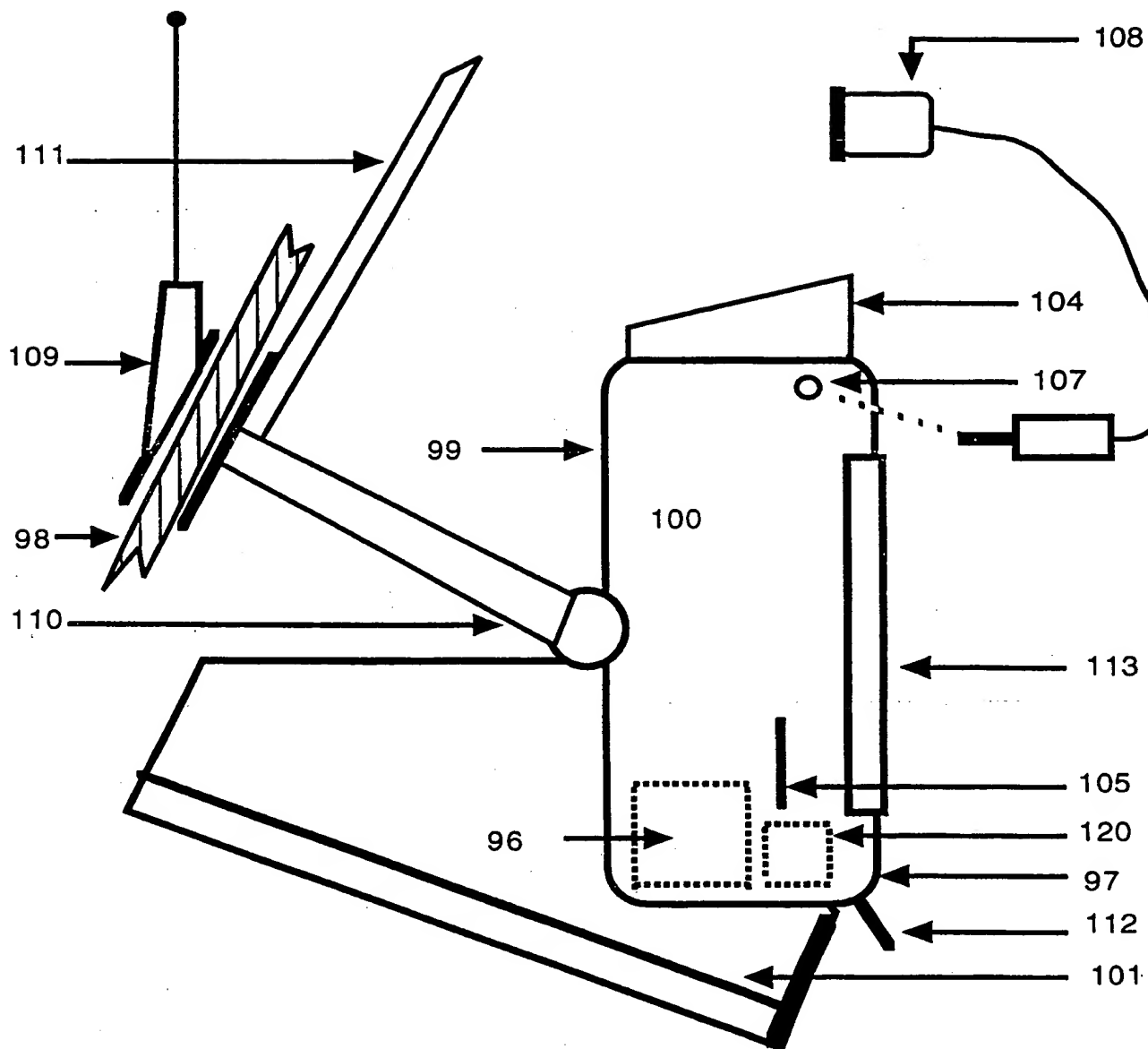
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FIG. 1



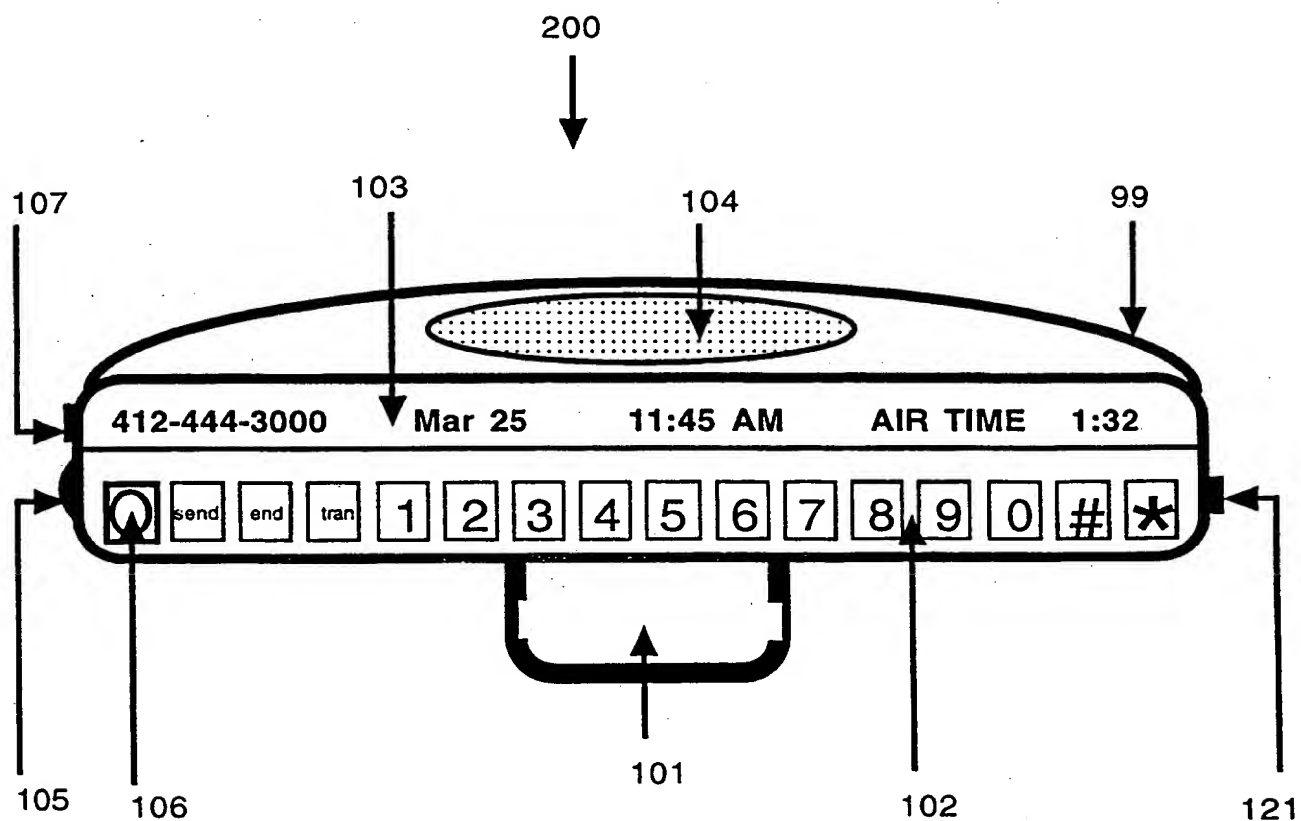
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FIG. 2



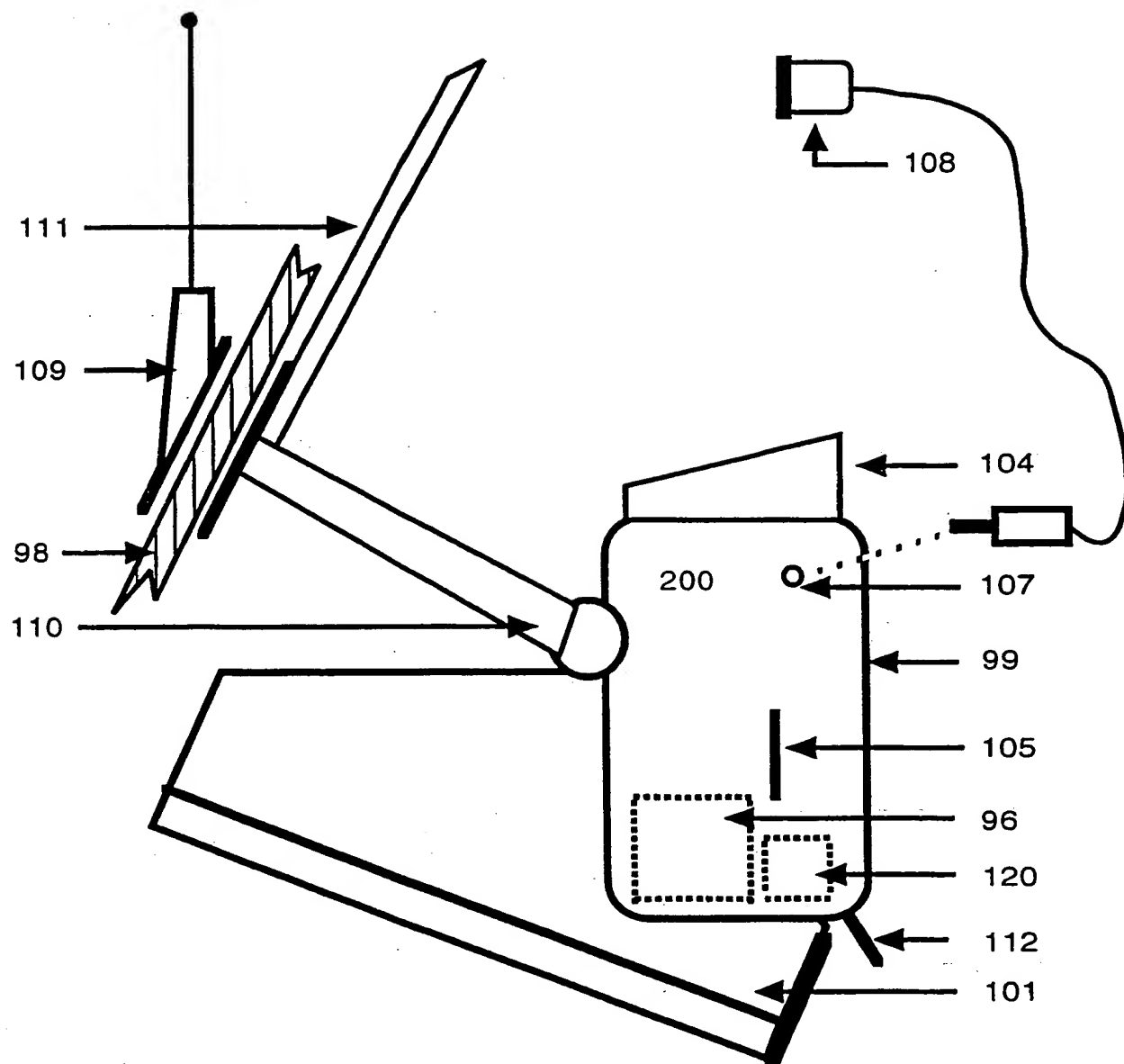
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FIG. 3



4/4

FIG. 4



INTERNATIONAL SEARCH REPORT

International Application No
PCT/US 99/12845

A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 H04B1/38 H04M1/60 B60R11/02

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 6 B60R H04M H04B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 4 706 273 A (SPEAR ET AL) 10 November 1987 (1987-11-10) abstract column 1, line 65 - column 2, line 45 column 3, line 30 - column 4, line 38 figures 1-3	1-5, 7-9, 11-14
A	EP 0 365 290 A (LEWO) 25 April 1990 (1990-04-25) column 1, line 40 - column 2, line 32 column 2, line 52 - column 4, line 28 figures 1,2 --- -/--	1,4,5, 7-9,11, 12

☒ Further documents are listed in the continuation of box C.

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Date of the actual completion of the international search

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INTERNATIONAL SEARCH REPORT

International Application No
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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 98 16905 A (COMBITECH TRAFFIC SYST AB ;JOHANSSON ALF (SE)) 23 April 1998 (1998-04-23) page 2, line 19 - line 29 page 3, line 19 - page 6, line 7 figures 1-3 -----	1,11,17
A	DE 36 05 704 A (SIEMENS AG) 27 August 1987 (1987-08-27) abstract column 1, line 55 - column 2, line 3 column 2, line 48 - column 3, line 18 figure 1 -----	1,2
A	GB 2 285 551 A (LEAD ELECTRONIC CO LTD) 12 July 1995 (1995-07-12) page 3, line 1 - line 9 , figures 1,5 -----	1

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 99/12845

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 4706273 A	10-11-1987	NONE	
EP 0365290 A	25-04-1990	US 4870676 A CA 1282836 A	26-09-1989 09-04-1991
WO 9816905 A	23-04-1998	NO 991775 A SE 9603788 A	14-04-1999 15-04-1998
DE 3605704 A	27-08-1987	NONE	
GB 2285551 A	12-07-1995	NONE	